Mata Kuliah	: Bahasa Inggris Teknik (Teori)
Kode Mata Kuliah	: KKIG0012
Waktu	: Selasa (01.00 – 14.20)
Jumlah SKS	: 2 SKS
Nama Dosen	: Azwita Azyb
Minggu ke	: 6 (Enam)
Tanggal	: 20-10-2015
Judul Materi	: Describing Numbers

Objective:
After completing this lesson you will be able to :

- **say and write numbers (cardinal, ordinal, fractions, roots, etc)**
- **say and write simple mathematical expressions and complex formulae**
- **say and write unit of measurements**

Binary Numbers

Our modern system of numbers is known as the Arabic system. Before this was developed, the Roman system was used. It had seven symbols:

I = 1
V = 5
X = 10
L = 50
C = 100
D = 500
M = 1000

Thus e.g. VIII = 8
LXI = 61

What disadvantages do you think the Roman system had?

Computers use the binary systems of numbers. This system only has two symbols: 1 and 0. Since an electric circuit is either on or off, these two symbols can be represented electrically: 1 is on and 0 is off.

Our normal system of counting has base 10 and so has ten digits: 1 2 3 4 5 6 7 8 9 0. The binary system has only two. To express 2, we can not write 2, since this symbol does not exist. So we move to the next column to the left and write 10 (= 1 (2) + 0(2)) [one times to to the power of one plus nought times two to the power of nought], which is the same as 2 in the decimal system.

Now we can use the old column again to count one more to 3, which in the binary system is 11 (= 1 (2) + 1(2)). To get 4 we move to the next column and write 100.

In other words in the decimal system we move to the next column after the first 10, the first 100, the first 1000, etc. In the binary system we move to the first column after 2, the second column after 4, the third column after 8, the fourth column after 16 and so on.

e.g. 14 = 8 + 4 + 2 + 0

$= 1(2)^3 + 1(2)^2 + 1(2)^1 + 0\ (2)^0$

= 1110 [one, one, one, nought]

and 25 = 16 + 8 + 0 + 0 +1

$= 1(2)^4 + 1(2)^3 + 0\ (2)^2 + 0\ (2)^1 + 1(2)^0$

= 11001 [one, one, nought, nought, one]

Language Expressions
Here are ways to say numbers :

Cardinal numbers

One; two; three; .... twenty; .... one/a hundred; .... one/a thousand
326 = three hundred and twenty six
4,072 = four thousand and seventy two
6,840 = six thousand eight hundred and forty
750,000 = seven hundred and fifty thousand
2,430,000 = two million, four hundred and thirty thousand
1,000,000,000 = one billion

Ordinal numbers and dates :

One of the problems with dates is that we write them and say them in a different way:
We write 25 May (or 25^{th} May), but we say *the twenty fifth of May or May the twenty fifth*
We write 2 June (or 2^{nd} June, but we say *the second of June or June the second*

1966 = nineteen sixty six
1909 = nineteen hundred and nine or nineteen oh nine
2010 = two thousand and ten

Note : article the is used with ordinal numbers especially in the dates.

Fraction and Decimals
Vulgar fractions

$2\,{}^1\!/_4$ = two and a quarter

$3\,{}^1\!/_2$ = three and a half

$4\,{}^3\!/_4$ = four and three quarters

$5\frac{1}{3}$ = five and a third

$\frac{5}{9}$ = five ninths

$1\frac{7}{8}$ = one and seven eights

note :

In fraction $\frac{3}{4}$, 3 is the numerator and 4 is denominator. In the spoken forms of vulgar fractions, the versions ‘ and a half / quarter / third’ are preferred to ‘one half / quarter / third’ whether the measurement is approximate or precise. With more obviously precise fractions like, ‘and one eight / sixteenth’ is normal. Complex fraction like is spoken as ‘ three over four six two’ especially in mathematical expressions.

Percentages

25 % = twenty five percent
50 % = fifty per cent
63 % = sixty three per cent
More than 50 % is majority, less than 50 % is the minority

Arithmetic

There are four basic processes of arithmetic for working out (= calculating) a problem

+ (addition)	e.g. 5 + 7 = 12 (five plus/and seven equals twelve)
- (subtraction)	e.g. 14 – 10 = 4 (fourteen minus ten equals four)
x (multiplication)	e.g. 4 x 4 = 16 (four times/multiplied by four equals sixteen)
: (division)	e.g. 6 : 2 = 3 (six divided by two equals three)

Saying ‘0’

This can be spoken in different ways in different contexts:

1. Telephone number: 2010762 = two oh one oh seven six two
2. Mathematics: 0.8 = nought point eight (point eight), 6.03 = six point oh three
3. Temperature: 12 degrees = twelve degrees below zero / minus twelve degrees
4. Football: 6-0 = six nil
5. Tennis: 20-0 = twenty love

Talking numbers

My home number has got odd number (3, 5, 7, 9, etc) but the house in front of mine has got even number (2, 4, 6, 8, etc).

Can you name the five *prime numbers*? (2, 3, 5, 7, 11)
Dewa got 45 out 50 in the English test last week (45/50)

Exponents

X^2 = x squared

X^3 = x cubed
X^n = x to the power (of) n , or x to the the n
X^{n-1} = x to the power (of) n minus one, or x to the n minus one
X^{-n} = x to the power (of) minus n, or x to the minus n

Roots
$\sqrt{x}$ = (the square) root of x
$\sqrt[3]{x}$ = (the) cube root of x
$\sqrt[n]{x}$ = n^{th} root of x

Formulae

$$A = 2\pi R_c \left[R_c - \sqrt{\left(R_c^2 - \frac{d^2}{4} \right)} \right]$$

Capital A equals two pi capital R subscript small c, open square brackets capital R subscript small c minus square root open brackets capital R subscript small c squared minus small d squared over four close brackets, close square bracket.

Bits and bytes

Computers do all calculations using a code made of just two numbers -0 and 1. This system is called **binary code**. The electronic circuits in a digital computer detect the different between two states: ON (the current passes through) or OFF (the current doesn't pass through) and represent these states as 1 or 0. Each 1 or 0 is called a **binary digit**, or **bit**.

Bits are grouped into eight-digit codes that typically represent characters (letters, numbers, and symbols). Eight bits together are called a **byte**. Thus, each character on a keyboard has its own arrangement of eight bits. For example, 01000001 for the letter A, 01000010 for B, and 01000011 for C.

Computers use a standard code for the binary representation of characters. This is the American Standard Code for information Interchange, or **ASCII** – pronounced/ 'aeski/ . In order to avoid complex calculation of bytes, we use bigger unit such as kilobytes, megabytes and gigabytes.

We use these units to describe the RAM memory, the storage capacity of disks and the size of a program or document.

Note: bit is pronounced /bit/; **byte** is pronounced /bait/

Unit of memory	**Abbreviation**	**Exact memory amount**
Binary digit	bit, b	1 or 0
Byte	B	8 bits
Kilobyte	KB or K	1,024 byte (2^{10})
Megabyte	MB	1,024 KB, or 1,048,576 byte (2^{20})
Gigabyte	GB	1,024 MB, or 1,073,741,824 byte (2^{30})
Terabyte	TB	1,024 GB, or 1,099,511,627,776 byte (2^{40})